

EDITORIAL ARTICLES.

ON THE DYSTROPHIES OBSERVED AFTER RESECTIONS—A CONTRIBUTION TO THE STUDY OF THE RESULTS GIVEN BY THESE OPERATIONS¹

As Prosector to the Faculty of Medicine at Lyons, M. Rochet works under the direction of M. Ollier, and in fact his paper, the title of which we quote, is based upon a study of sixty of Ollier's cases of resection.

The best way to get a just idea of the value of a particular mode of treatment is to study the distant results of it.

This study is not altogether simple. One may approach it from various different points of view. There is the degree of usefulness remaining in the limb or organ operated on. There is the effect on the progress of the original disease; and again there is the ultimate effect of the operation on the general state of the patient. Take for example a joint after resection. What is the condition of the articulation or rather of its former site when examined many months afterwards? How much solidity or what degree of movement? How are the affected bones as regards length and thickness? What is the patient's general condition? Has the progress of the local disease been checked? What is the state of the surrounding soft parts, and what that of the general nutrition of the limb? Are there nutritive alterations in the skin, muscles, nerves, and what is their nature?

The study of these distant results of excisions has been made already by G. Wolff, Gurlt, Lossen, Baraban, and above all, by M. Ollier in his masterly "Treatise on Resections."

¹Des dystrophies observées à la suite des résections (Contribution à l'étude des résultats généraux fournis par ces opérations). Par V. ROCHET, Prosecteur à la Faculté de médecine de Lyon. *Revue de Chirurgie*, No. 10, Octobre, 1887.

But there is one particular point of this investigation which has been, if not unnoticed, at least very incompletely examined by those authors, although M. Ollier has indicated its importance and called attention to its principal characteristics, namely, the trophic disturbances observed in the subjects of resections. Under this head are classed alterations of nutrition affecting various organic structures, skin, muscles, nerves and skeleton, and also the appendages of the skin, *e. g.* hairs and nails. They are characterized by important changes in the appearance and function of these parts. Some of these effects are of comparative unimportance, because they influence merely appearance. But others, associated as they are with great or even total incapacity, severe pain, etc., are of the greatest moment.

M. Rochet, while acknowledging that J. Wolff studied these changes very ably, thinks he was too concise in his treatment of them. M. Rochet is careful not to lay himself open to that charge. Wolff regarded only the changes in the skin and its belongings. He paid no attention to the osseous, nervous and muscular lesions. He established no distinctions between the changes observed after pathological resections and those seen after traumatic ones ; but the difference is immense between the suites of these two classes. Moreover Wolff made a very serious mistake in greatly exaggerating the evil nature of the prognosis to be derived from the phenomena he described, and in stating that resection would only make matters worse. The truth is that resection made under suitable conditions lessen the trophical disturbances.

Gurlt put down to the account of resections every thing which followed them, and, nevertheless, it is not the operation which is responsible for the dystrophies ; they pre-exist before the resection, are met with as sequences of other modes of treatment or in the course of chronic osseous and articular affections, and have no special relation to resection.

We can partly confirm the truth of M. Rochet's statement, but have nevertheless seen grave trophic alterations which were almost certainly the result of resections and not of the diseases for which they were done. Is not M. Rochet in his indignation at Gurlt's statements going rather to the other extreme ?

The worst of the trophic changes described by Gurlt are special to traumatic resections, made, as is well known, under particularly unfavorable conditions. Such are never observed after properly executed pathological resections.

Loosen and Baraban made only a summary investigation of the influence exercised by resection on the general nutrition of the limbs. Delorme was still more brief.

Only in M. Ollier's book is to be found a methodical, and, in some points complete exposition of the subject.

The investigations of M. Rochet have been prosecuted under the direction of and with the counsel of M. Ollier, and the chief features of the work were indicated in an inaugural thesis, published at Lyons in 1885. Besides the sixty cases of resection studied, there have also been examined a large number of persons affected with joint and bone troubles and treated by other methods than resection, such as immobilization and bandages, arthrotomy, amputation.

After describing what he found the author compares his observations with those of Gurlt and comes to the conclusion above indicated with regard to the latter. Afterwards he shows that, in general, resection has nothing to do with the production of the troubles described. Finally are given a study of the evolution of the different nutritive alterations in the different classes and cases, as well as short remarks on treatment.

I. Review of the tropical disturbances of various kinds observed by M. Rochet after resections.

The nutritive alterations affecting the cutaneous envelope show themselves by preference in the feet and hands, and are manifested by various signs. In certain cases there is a furfuraceous exfoliation consecutive to true desquamation of the epidermis. M. Rochet has never seen this kind of epidermic dust replaced by a desquamation in large flakes analogous to that which follows *scarlatina*. There is, however, a girl with ankylosis of the knee and old dislocation of the hip in whom the epidermic flakes are very large, especially on the foot, where some of them measure an inch or more. She is at present under the joint care of myself and Mr. Henry Baker, and the trophic alterations have supervened on the joint lesions.

More commonly there is present the condition known as "glossy skin," or an approach to it. The cutaneous pores and wrinkles have disappeared.

The coloration of the skin may be livid. It is oftener dark red or violet red.

Next, as to the nails, hairs, sweat and subcutaneous cellular tissue. The nails grow faster; they become dry, and their aspect is dull; their surface loses its normal polish; they become thicker and more convex in every direction. Sometimes appear very marked transverse grooves. These changes, observed by Wolff, have been noted also by Rochet.

The *hairs* are generally developed on the affected limb to a degree which at once strikes the eye. In a few cases the converse has been observed. Usually, also, the pigmentation of the hairs is deepened. Gurlt has twice seen the hairs more blonde. The consistence of the hair is generally increased. The area affected by these alterations varies between that over and around the joint and that of the whole limb. But always the new formation affects the aspect of the limb normally most hirsute, namely the side of extension. The scattered hairs occasionally developed abnormally around fistulæ and incisions are usually long and delicate.

In investigating the state of the sweat secretion, two methods may be followed: first, the unsatisfactory one of interrogating the patient; secondly, the much more exact "methode des empreintes" of M. Aubert.¹ The latter registers even minute variations.

The sweat may be modified in either quantity or quality. In the great majority of cases, Wolff, Gurlt and Rochet have all noticed exaggeration of the sudoral function. Like the growth of hairs, it may be limited or may affect the entire limb. Often it is limited to, or at least most marked in the feet and hands. In the case of the upper extremity, it may be confined to the axilla.

Diminution of the sweat is noticed sometimes, but rarely.

The changes in the quality of the secretion are indisputable. Weir Mitchell had already noticed this particular in the sequelæ of nerve-traumatism accompanied by disordered perspiration. The sweat be-

¹*Annales de Dermatologie*, 1877-78.

comes cold and viscid. It is acid, 'sour,' as the patients say, and richer in odoriferous principles.

To complete the trophical disturbances of the cutaneous system, one should add the nutritive alterations in the subcutaneous cellular tissue. They consist of the accumulation of an abnormal quantity of subcutaneous fat. It is the lesion studied by Landouzy¹ in connection with deuteropathic muscular atrophies, under the name of "adipose." This is frequently met with in the subjects of resections. It must not be confounded with œdema, and does not pit on pressure.

Adipose in the subjects of resection is extremely variable, both in extent and thickness. It is far from existing constantly, and is not nearly as frequent as the changes already noted. In Ollier's 607 cases studied by Rochet, it occurred only five times. When the function of the limb is restored, adipose tends to disappear. It is not easy to distinguish between adipose and normal fatness beneath the skin in childhood. It is especially in scrofulous subjects and above all in females that adipose is found. The condition is almost always localized to a segment of the limb. After resection of the shoulder it is ordinarily the arm which is affected. After excision of the elbow, it is also the arm usually where the condition of adipose appears. It rarely seems to follow excision of the wrist. After excision of the hip, the thigh and especially the upper part of it is affected. As a sequence of excision of the knee the whole limb is sometimes affected at first, but only the lower part of the thigh afterwards. After resection of the ankle it is, in the vast majority of cases, confined to the leg.

M. Rochet next deals with that important trophic change, *muscular atrophy*.

This is constant in limbs the seat of resection. But it varies greatly in degree. Often, while well marked immediately after operation, it steadily retrogresses afterward. But the atrophy is liable to increase from time to time under intercurrent influences. ("*Atrophie intermittente*"—Ollier.) Usually the whole limb is affected, but those parts worst which are nearest the resected joint.

A direct relation has been asserted between muscular atrophy and

¹ *Revue Mensuelle*, 1878.

adipose ; but the idea is mainly based on the *a priori* theories which have been upset by the observations of Landouzy. Also, as a matter of fact, there is no constant relation between the two. Extreme atrophy may exist without any adipose. Still, the possible co-existence, or rather, the frequent co-existence of the two diminishes the value of conclusions as to the strength of a resected limb, drawn from mere measurements, as adipose may veil atrophy. As M. Ollier says, the best way to measure the degree of atrophy is to infer it from the degree of muscular *force* found to be lost. M. Ollier goes so far as to write that a patient with resected elbow may preserve all his normal strength with an arm obviously much wasted, and explains this by the theory that the wasting in such a case is in the sub-aponeurotic and interstitial fat, and not in the muscular fibres.

Interesting *thermic* modifications take place. They seem to be extremely frequent and also extremely variable both in different persons and in the same individual. Sometimes they are easily appreciable by the naked hand, but it is much better to use the thermometer, by which alone can precise results be obtained. Certain precautions must be taken. Both sides should be exposed to the air at the same moment. Two exactly corresponding thermometers should be used to the two sides simultaneously. Both Gurlt and Wolff have very properly insisted on the distinction being carefully made between subjective and objective coldness. A patient may feel cold in the limb without its being so, and vice versa. A certain degree of coldness is almost universal in the resected limb ; but it is rarely marked in amount, usually varying between 4 and 8-tenths of a degree. The amount of cold varies greatly in the same individual, being for example much more marked in winter than in summer. In exceptional cases the temperature is raised on the side of resection. Gurlt and Ollier have also noticed hyperthermia on the side of resection.

Having thus reviewed the various kinds of trophic alterations which may follow resection, the author proceeds to classify them broadly into those which may be termed benign and those which are more serious. In the *former* class are the changes in the skin, hair and nails and subcutaneous fat, also in the sudorific function. In the *latter*

are the affections of muscles, of the temperature, and of the great nerves and vessels. It is true that Rochet has met with no serious affections of the great nerves and vessels in his researches, but Gurlt, who deals with military resections, describes them on every page. Ollier, writing of these, says "We have already pointed out as the cause of floating limbs, defective operative technique, *i. e.* the removal of the capsulo-ligamentous apparatus of the original joint; the absence of regular post-operative treatment; the too great height of the portions of bone removed in conditions where regeneration is impossible. These are the three principal causes, but there are others which assist, *viz*: Muscular atrophy and the trophical troubles which follow lesions of nerves and vessels."

The statements of Gurlt are so surprising when the severity of the trophic changes observed by him is compared with that of the cases examined by Rochet that the latter asks if the former employed modes of estimating it sufficiently exact.

To take first Gurlt's observations respecting the temperature of the limb.

For the shoulder, in more than 100 cases, the temperature was found lowered in 41, the amount being 1,293 and even 6 and 8 degrees. After resection of the elbow, still greater differences were noted—in two cases as much as 10 degrees. All the cases were furnished by the Franco-German war.

Strange as are these greatly lowered temperatures the extent of the "hyperthermias" recorded by Gurlt is more astonishing. They include cases in which the temperature was raised on the side of resection as much as 8 or 10 degrees. Rochet says that there are only two ways of explaining Gurlt's observations. Either they are not made with precise appliances, or the cases must have been the subject of grave accidental injuries, especially wounds of nerve trunks caused either by the original accident or by the surgeon. In fact Gurlt records some instances of injury to the radial and ulnar nerves during operation. Nevertheless Rochet doubts the precision of Gurlt's methods of comparing the temperatures.

More surprising still are the vascular modifications observed by

Gurlt. After resection of the shoulder the pulse was often found weakened and sometimes even retarded. In one case it beat only from 4 to 8 times a minute. No explanation is offered of this last mentioned phenomenon.

That the pulse should be weakened in certain cases is not surprising. When a resection is so done that at the site of the joint removed the continuity of the limb is only maintained by the skin and the vessels and nerve-trunks, grave vascular disturbance is just what might be expected. As Ollier has pointed out, the vascular and nervous stretching causes œdema and general impediment to the circulation. The original traumatism may also have necessitated the ligature of a main vessel.

It must be remembered that Gurlt does not pretend to have observed all the facts and phenomena he gives himself, on the contrary, they are collected from the reports of various surgeons.

Finally M. Rochet asks what is proved by all these grave results, and in reply, says they all demonstrate the importance of distinguishing between resections done for disease and those done for accident, at least as regards their ultimate prognosis.

But M. Ollier hopes that when the operative and post-operative methods advocated by himself are generally adopted, even resections done for injury will show much better results. In proof of this he cites six resections of the elbow done by himself during the Franco-German war, and compares their results with those described by the German surgeons, the comparison being very much to the disadvantage of the latter.

In drawing conclusions from the statements and arguments of M. Rochet's extremely able and interesting paper, of which the above is only an imperfect abstract, it must not be forgotten that there are other grave trophic changes, besides those quoted from Gurlt for the purpose mainly of being explained away or at least shown to have no business to have happened. For instance, there is the irresistible tendency to assume a position of abduction and to lose effective power of adduction after excision of the hip, and its objectionable consequence, a practical shortening of the limb far in excess of that given by

the surgeon who merely measures the two limbs and tries to persuade himself and his pupils of the beauty of the result.

And again, there is the steady increase of the relative shortening after anything like free excision of the knee in childhood. These are trophic changes which M. Rochet ignores

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